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10/706,891

11/13/2003

Dong-Yang Lee

5649-1203

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01/25/2005

MYERS BIGEL SIBLEY & SAJOVEC

PO BOX 37428

RALEIGH, NC 27627

EXAMINER

NGUYEN, DANG T

ART UNIT

PAPER NUMBER

2824

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,891

Applicant(s)

LEE, DONG-YANG

Examiner

Dang T Nguyen

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-24 is/are allowed.
- 6) ☒ Claim(s) 1,3-9 and 11-13 is/are rejected.
- 7) ☒ Claim(s) 2,10,14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☒ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: Search history.

DETAILED ACTION

1. This action is responsive to the following communications: the Application filed on November 13, 2003.
2. Claims 1 – 24 are pending in this case. Claims 1, 7, 12, 13, 16, and 21 are independent claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-9, and 11 - 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Schaefer, U.S. patent No. 5,636,173 – filed Jun. 7, 1995.

Regarding independent claim 1, Figure 1 of Schaefer discloses a method of precharging a bank of memory cells in a semiconductor memory device, the method comprising:

receiving a command that includes an auto-precharge function to the semiconductor memory device (Col. 4 lines 63-64)

initiating a timer [60] in response to the received command (Col. 4 lines 54-59); and automatically precharging the bank responsive to the timer [60] reaches a predetermined value (Col. 4 lines 65-67) .

Regarding dependent claim 3, Figs. 5 and 6 of Schaefer discloses wherein the received command is associated with data stored in a specific row of the bank, and

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wherein the method further comprises precharging the bank (Fig. 5 [PRECHG] at Tsub7 of BANK 0) when prior to the timer reaching the predetermined value a second command (BANK 1 [READ]) is received by the semiconductor memory device that is associated with data stored in a different row of the bank (Col. 9 line 45 – Col. 10 line 9).

Regarding dependent claim 4, Schaefer discloses wherein the received command is associated with data stored in a specific row of the bank, and wherein the specific row of the bank is left open for a period of time after an operation associated with the command is completed (col. 9 lines 15-22 *for disclosing open bank memory arrays coupled with the high-speed burst mode READ command and WRITE command may provide a “seamless” flow of data, however, require an extra dead cycle*).

Regarding dependent claim 5, Fig. 5 discloses wherein the received command is a first read command (at Tsub3 Bank 0 first [READ]), and wherein the method further comprises performing a first read operation in response to the first read command and performing a second read operation (at Tsub13 perform a second [READ] after completion of the first read operation using a page mode operation (Col. 9 line 45 – Col. 10 line 9).

Regarding dependent claim 6, Schaefer discloses the method further comprising initiating a second timer in response to the received command and storing a row address associated with the received command (see Figs. 5 and 6).

Regarding independent claim 7, Fig. 1 of Schaefer discloses a semiconductor memory device, comprising: a memory cell array [22] arranged in rows and columns; and a precharge control circuit having at least one timer [60], wherein the precharge

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control circuit [28] is configured to issue a precharge control signal [26] to the memory cell array responsive to receipt of a command that includes an auto-precharge function a predetermined time after the command is received (Col. 9 lines 28-35).

Regarding dependent claim 8, Fig. 1 of Schaefer discloses wherein the precharge control circuit [28] issues an auto-precharge control signal [26] to the memory cell array responsive to the at least one timer [60] reaching the predetermined time [burst read cycle] (Col. 4 line 61-67).

Regarding dependent claim 9, Fig. 1 of Schaefer discloses further comprising a storage device [60] that stores the predetermined time.

Regarding dependent claim 11, Fig. 1 of Schaefer discloses further comprising a row decoder [52] for decoding an externally received row address [48] and a command decoder [26] that activates an auto-precharge control signal in response to the input of a command having the auto-precharge function (Col. 4 lines 26-51).

Regarding dependent claim 12, Fig. 1 of Schaefer discloses a method of precharging a bank of memory cells in a semiconductor memory device, the method comprising:

receiving at the semiconductor memory device a read command that includes an auto-precharge function (Col. 4 lines 63-64 and Col. 9 lines 2-3);

starting a timer responsive to receiving the received read command (Col. 9 lines 46-47);

performing a read operation responsive to the received read command (Col. 4 lines 51-59);

delaying initiation of an auto-precharge operation called for by the auto-

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precharge function until the timer reaches a predetermined time (Col. 10 lines 34-46).

Regarding independent claim 13, Fig. 1 of Schaefer discloses a method of reading data from a semiconductor memory device, the method comprising:

receiving a read command that includes an auto-precharge function at the semiconductor memory device (Col. 4 lines 63-64 and Col. 9 lines 2-3);

reading a first data bit [READ at T3] from a cell in a first bank [Bank 0] of cells in the semiconductor memory device in response to the received read command (Fig. 5, Col. 9 lines 46-47); and using a page mode operation to read a second data bit [READ at T13] from a second cell in the first bank [Bank 0] of cells in the semiconductor memory device in response to a second read command (Fig. 5 Col. 10 lines 3-5).

Allowable Subject Matter

4. Claims 2, 10, 14, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 2, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "resetting the timer when prior to the timer reaching the predetermined value a second command is received by the semiconductor memory device that is associated with additional data stored in the specific row of the bank".

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With respect to claim 10, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "wherein the semiconductor memory device further comprises a second timer that measures passage of the predetermined auto-precharge time and a row address storage register that is associated with the second timer".

With respect to claim 14, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "initiating a timer that measures an auto-precharge delay period in response to receiving the first read command".

5. Claims 16 - 24 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With regard to claim 16, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "a precharge control circuit that includes at least one timer that is reset in response to the auto-precharge control signal and that initiates precharging of at least a part of the memory cell array when the at least one timer reaches a predetermined value".

With regard to claim 21, the primary reason for indication of allowable subject matter is that the prior art fails to teach or suggest "wherein the timer corresponding to the selected bank is reset in response to auto-precharge control signal, and controls the bank to be precharged when the timer reaches a predetermined value".

Prior art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

| | | |
|-------|-----------------------|-------------------------------|
| Ogura | Patent No.: 6,147,916 | Date of Patent: Nov. 14, 2000 |
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| Jang et al. | Pub. No.: US 2001/0017805 A1 | Pub. Date: Aug. 30, 2001 |
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Contact Information

7. Any inquiry concerning this communication from the examiner should be directed to Dang Nguyen, who can be reached by telephone at (571) 272-1955. Normal contact times are M-F, 8:00 AM - 4:30 PM.

Upon an unsuccessful attempt to contact the examiner, the examiner's supervisor, Richard Elms, may be reached at (571) 272-1869.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is (703) 305-3900. The faxed phone number for organization where this application or proceeding is assigned is (703) 872-9306.

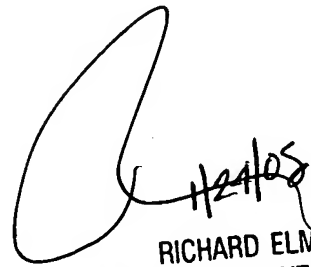
Information regarding the Status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business

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Center (EBC) at 866-217-9197 (toll-free) or EBC@uspto.gov.

Dang Nguyen 1/19/2005

lc
11/24/05
The drawings are objected to as
Figures 1A and 1B should be labelled
PRIOR ART.


RICHARD ELMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800